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Diseases of Dogs Following Distemper

DISCUSSION BY THE CENTRAL VETERINARY SOCIETY*

Professor Thos. Dalling: It is some years since I had much to do with distemper in the dog, but at one time I was greatly interested. Following the discovery of the true ætiology of canine distemper and the methods of immunization in its prophylaxis, the picture of the true virus infection compared with complications and diseases which may follow on after the original virus infection has been clarified to some extent. It is well established that infection with the virus of distemper is often followed by a simple febrile condition from which the affected dog recovers in due course without the development of any secondary or complicating factors: such dogs are solidly immune as can be shown by infection tests. In other infected animals, however, secondary infections play a big part in the setting up of disturbances which lead to various tissue changes : in fact. it is often these further infections and changes which are observed, rather than the initial virus infection, and which are grouped clinically under the term " distemper."

In discussing this subject, therefore, we must differentiate between disease due to the action of the virus of canine distemper and diseases which occur because of the initial virus infection but actually are associated with changes and disturbances following further infection superimposed upon the effects of the original virus infection.

There is no doubt that if canine distemper could be completely eliminated from the country much of the disease in young dogs would disappear, for it is now accepted that infection with the virus of canine distemper is by far the greatest cause of illness and mortality in the canine population. It is held by some that many of the infections which accompany or follow true virus infection, may occur independent of the virus infection: there is, however, much evidence that a preliminary virus infection is the common precursor of many of the other infections of the dog. It may be that in some instances the virulence of some of the secondary infecting viruses and micro-organisms becomes increased because of their passage through dogs originally infected with the canine distemper virus and that in such circumstances their pathogenicity becomes so exalted that they can invade tissues without any preliminary tissue changes and so give rise to alterations and disturbances which are recognized as clinical disease. At the same time it has to be borne in mind that some of the commonest invading micro-organisms can be recovered from the systems of the apparently healthy dog and that there they remain without setting up any recognizable clinical symptoms of disease: it is only when the tissues are already lowered in resistance that they are enabled to invade and to give rise to recognizable disease. It seems highly probable, therefore, that if the micro-organisms commonly found in the various systems can of themselves cause infection, without any preliminary preparation of tissues, their virulence and pathogenicity has already been raised in animals suffering from the effects of the invasion of canine distemper virus: and that they have been transferred from such animals to healthy dogs—in other words, when secondary invading organisms set up disease in dogs without the presence of canine distemper virus the infecting organisms are not those already present in the affected animal but are organisms whose virulence has been altered in other dogs to such an extent that they can invade tissues without any preliminary preparation. It must also be realized, I think, that the virulence of micro-organisms normally present in the systems of animals may become altered by causes other than the virus of canine distemper. We have still much to learn about the relationship of the bacteria and probably viruses in the system of the healthy animal to such things as nutrition and the variations which take place at different ages as the result of changes in feeding.

Because the virus of canine distemper can invade all tissues it follows that there may occur disease in any tissue following a virus infection: it is doubtful whether the changes in any tissue, with the exception of nervous tissue, due simply to virus infection are often so marked as to cause important clinical disease. Much will probably depend upon the virulence of the strain of the infecting virus and the powers of resistance and recuperation of the infected dog. I formed the opinion when I was working with distemper virus, rightly or wrongly, that in the average dog susceptible to canine distemper virus, the risk of the occurrence of disease of an important character due entirely to the effects of the virus were small: following the return of the temperature to a normal condition, in the absence of intercurrent infections the dog remained healthy in an immune condition. Other workers have also formed similar opinions. The nervous system is omitted from these remarks for most workers are familiar with the encephalitis of dogs which occurs in a percentage of artificially infected animals either early in the infection or some weeks later.

In the field the diseases following upon distemper which are most commonly found are those involving the respiratory and alimentary tracts, affections of the eye and of the nervous system. Diseases of other systems and tissues may also be found, *e.g.*, nephritis, which seem to be of common occurrence in dogs. As I am not a clinician I leave it to others to discuss clinical symptoms, treatment, etc., and confine my remarks to more general considerations.

Affections of the respiratory tract are common in the so-called distemper cases and it will be remembered that one school of thought which held sway for some time claimed that *B. bronchisepticus* and possibly other micro-organisms were the sole cause of canine distemper. It seems clear now that in the pure virus infection severe disease in the bronchi and the lungs is extremely rare and that such diseases are due to secondary infections and can thus be grouped as diseases following distemper. The diseases differ, naturally, with the site involved and vary from simple inflammation of the bronchi to true broncho-pneumonia with or without the further complication of purulent broncho-pneumonia and empyaema. The slight cough and nasal discharge in pure virus infections are well known: it is, therefore, to be expected that the respiratory tract will be one of the sites to be involved in early complications or sequels to the invasion of virus. Affections of the respiratory tract can, of course, arise without the previous virus infection but, as with many diseases, especially of young dogs, their presence should cause suspicion that true distemper virus is present in the kennel. When such affections of the respiratory tract are in an advanced state it is doubtful whether any distemper virus can be recovered from the affected tissues or from any of the body tissues: the result is that, in a search for the underlying cause, it may not always be possible to demonstrate the presence of the virus and it may, therefore, be wrongly assumed that the true cause is other than the virus of canine distemper. In some cases it may be that little or no evidence of any illness was observed prior to a severe lung infection: thus difficulty is added to the diagnosis of the root cause. It is very doubtful if, in such advanced conditions of the respiratory tract, specific treatment for virus infection is of any material value; there is some evidence, however, that antiserums may be effective in cutting short the disease if they are used for specific infections. Recent observations indicate, of course, that chemotherapeutical agents and antibiotics may be of some value. Much depends on diagnosis of the infecting organisms: we still require information on methods for the rapid diagnosis of respiratory infections in dogs in order that suitable treatment can be started in the early stages of the disease.

Affections of the alimentary tract following true virus infections also vary and are probably more common than is generally believed. The diarrhoea found in the early stages of virus infection usually ceases with the general cessation of the infection but may persist according to the amount of damage that has been done to the tissues and to the presence of and virulence of invading secondary micro-organisms. Dysentery, of varying severity, may occur even in the simple virus infection but may persist in later stages of the disease. Diarrhoea, as a complicating factor, interferes greatly with the recovery of the animal and, with other factors, is responsible for the considerable loss in condition which is associated with virus infection and the secondary diseases. A variety of micro-organisms have been described as giving rise to lesions and disease of the alimentary tract, following virus infection: it is difficult to ascribe to any particular group the role

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of pathogens, knowing well that the virus itself may be responsible to a marked extent for the disturbances that occur.

Affections of the mouth are found in dogs following infection with distemper virus. They are well known to veterinary practitioners: they have to be regarded as diseases following distemper because in the pure virus disease they do not appear to occur. A disease referred to as "infectious brown mouth" was at one time thought to be an entity, apart from a previous virus infection: it is doubtful in the light of all the knowledge we now have, whether this condition exists as a separate disease or infection or whether it is merely a disease following distemper, caused by the invasion of micro-organisms or larger parasites into the buccal mucous membrane and surrounding tissues.

Doubtless there are many more diseases of the alimentary tract which are familiar to veterinary practitioners and which are the results of an initial distemper virus infection.

Affections of the eye are well recognized as diseases following distemper in the dog. The watery conjunctival discharge is common in uncomplicated virus infection. The invasion of micro-organisms soon gives rise to complications which may involve the various eye structures with the occurrence of any of the well-known diseases. Again, it may be that little abnormal was observed in the health of the dog until an eye lesion appeared; the original virus infection may have been so mild as to have passed unnoticed. It would be misleading, of course, if all diesases of the eye were to be ascribed to an earlier distemper virus infection; nevertheless, it is important to give consideration to such a cause in order to exclude the possibility of spread to other susceptible dogs.

Veterinary surgeons are familiar with skin lesions which may be found following an attack of true distemper. There has been much discussion on whether such lesions are found in uncomplicated virus infection. From observations by different workers it would seem that they are not the direct result of virus infection but arise rather from infections of the skin as do lesions in other parts of the body; in other words, they may follow a distemper infection. Staphylococci are often found in such lesions and in their treatment there is room for trials of some of the newer chemotherapeutical agents. There is, of course, a tendency for such skin lesions to disappear spontaneously, as the dog's general health improves and the various organs and systems function normally.

Nervous complications and affections of the nervous system following distemper infection are probably the most serious with which a clinician has to deal. Our knowledge of the diseases of the nervous system of domesticated animals, including the dog, is still very incomplete: there is much to learn before we can make assertive statements. We know that nervous complications arise in the course of distemper virus infection. Thus, Dunkin and Laidlaw in their studies of artificially produced virus distemper say: "Nerve symptoms may be met with at two different stages of the disease, and, in our experience, are always of serious import. We have encountered them only in about 10 per cent. of our cases. The symptoms that we have observed are chorea, fits, and epileptiform convulsions. Fits may occur early in the second febrile period, and at first they are slight and of short duration, they may pass off: but on two occasions they became more and more severe and emerged into violent epileptiform convulsions which necessitated the destruction of the animal. Late in the second febrile period after some three or four weeks of continuous illness, a similar set of symptoms has been encountered and at this time also chorea has been observed. In the relatively few nerve cases we have studied the chorea has been followed by fits and epileptiform convulsions." These authors were working with susceptible young dogs which were infected artificially with canine distemper virus, injected subcutaneously: it follows from their observations that, in some cases at least, distemper virus can cause affection of the nervous system. It is also well known that the virus can be recovered from the brain substance of dogs which are showing nerve symptoms; but all affected dogs do not yield samples of virus from the brain. The virus when recovered from the brain substance and injected into susceptible dogs gives rise to the classical symptoms of canine distemper which may or may not include nerve symptoms. Again there is some evidence that in some dogs distemper virus may give rise to nerve symptoms only without the occurrence of any of the other recognized symptoms. From all the available evidence there seems little doubt that distemper virus can be responsible for nerve symptoms and lesions in dogs.

The lesions have been variously described by different observers. Thus, Dunkin and Laidlaw describe "great engorgement of the vessels of the meninges, with a large excess of cerebro-spinal fluid" and microscopical examination showed "small collections of small round cells scattered here and there in the cortex and around the ependyma and also a very irregularly distributed degeneration of nerve cells." They conclude by saying that "there is thus evidence of an acute encephalitis but it does not seem to have any characteristic feature." Other workers have classified nervous distemper as falling into three groups according to the histopathological findings, *i.e.*, those in which there is a generalized hyperaemia of the brain and spinal cord; those in which there is a glial proliferation and incomplete necrosis of the ganglion cells and in which the mesodermal vessels are only slightly involved, and those in which the inflammatory changes involve the whole of the central nervous system and the meninges.

Canine encephalitis and its causes are not yet clearly understood. Innes reviewed the position in 1939 and referred to some work which he and I did together. He referred to the work of Perdrau and Pugh who studied a number of cases and found that there was evidence of subacute disseminated sclerosis in four out of 14 cases of disseminated encephalitis in dogs, with infiltrations of the meninges and perivascular "cuffing" in others: they came to the conclusion that "distemper was not an essential antecedent of the disease, as it occurred in only seven of their 14 cases, but the virus played a role similar to that which some acute infections play in certain post-infective demyelinating diseases of man." From a study of over 50 dogs with "nervous disorder" Innes came to the conclusion that "there is enough pathological evidence to show that more than one entity may occur in the dog which have been regarded in the past as nervous forms of distemper or as "post-distemper encephalitis," and in which the association of the distemper virus is problematical. It seems evident, therefore from all the observations which have been made, that although the distemper virus may be associated with nerve symptoms and lesions, there exist other conditions in dogs in which the symptoms may simulate or be similar to those associated with virus infection but of which the cause or causes are different and may not yet be known.

The question of a latent virus infection in the central nervous system has to be kept in mind, *i.e.*, not the virus of canine distemper but some other virus. We know that viruses do exist in the central nervous system of animals, that they can be stimulated to produce nervous symptoms and lesions and that they can be transferred experimentally to other animals in which they set up similar symptoms and lesions. That distemper virus may have attached to it other viruses is highly probable, for some American workers isolated two viruses from a strain of distemper virus which had been passaged through many dogs, *viz.*, a true canine distemper virus and the virus of lymphocytic choriomeningitis.

The virus of fox encephalitis must also be noted. Innes and myself were able to show that the contention of Green who has carried out so many observations on this virus was correct, *viz.*, that the two viruses (fox encephalitis and canine distemper) are distinct. To what extent, if any, the fox encephalitis virus is found in dogs in this country, is quite unknown.

I cannot end this point better than to quote from Innes' article "the disease (canine encephalitis) occurs very frequently, and probably more often than the post-infective encephalitis in man. The nervous phenomena in the dog known as 'fits,' 'hysteria,' 'chorea,' 'epileptiform convulsions' are vague in meaning—the study of these conditions would be valuable not only to clarify their significance but also to understand better the acute and chronic forms of disseminated encephalomyelitis in man."

May I finish off my contribution to the subject under discussion with a plea for more research in the diseases following distemper. We know a lot about pure distemper virus infection: our knowledge of what comes after is very incomplete, especially concerning affections of the nervous system.

Mr. J. K. Bateman: It gives me very great pleasure to be coupled with Professor Dalling in a discussion on distemper sequelae. We met first over an outbreak which we have now decided, after about 20 years (!), definitely was distemper. Since then we have had very long discussions at the bench, in armchairs and in the field. We are still firmly held by that one bond. He has always provided the scientific background of facts. I have made the mistakes from which he has gained some, at any rate, of his clinical knowledge. I have no doubt that you will agree that our papers to-day continue in that order. You may believe what he has said, but you will argue about my contribution.

Having heard Professor Dalling's treatise on distemper from the scientist's point of view we can now look on the subject from the clinician's standpoint. We agree wholeheartedly, I am sure, that clinical distemper is still the most disastrous of diseases of

dogs, and after many years of experience in the field I have to confess that there is as yet no certain method of cure.

We were offered much hope, at one time, for its total elimination by means of Laidlaw-Dunkin methods but our experiences in recent years have not been happy and we must hope that the troubles being experienced by the manufacturers are only temporary.

The simple febrile state of true uncomplicated distemper is seldom seen and recognized in the field and I personally know of only two types of case in which I have met it. These are (*a*) in the in-contact dog already treated by antibody which reacts slightly to infection and recovers without incident and (*b*) the naturally infected dog which receives massive doses of serum whilst the initial temperature is still high. Such a dog may recover without incident also and without showing any symptoms of secondary infection.

It is, however, with the secondary conditions that we are concerned to-day, and I propose to deal with them in the order of their importance.

Firstly without a doubt, we must place the conditions which affect the central nervous system.

We find in them that any one type tends to incurability—partial or complete, and that certain areas of the dog's brain tend to become permanently damaged. It is not unusual for brain symptoms to be manifest from the time of the primary temperature rise. But it is unusual in natural infection for a dog to start with one fit at this stage and to proceed in the course of the next few days to take multiple fits and die. Commonly it is noticed that a dog has an attack of hysteria with his primary rise in temperature. When the temperature drops, the attack disappears without treatment and the dog may go through a prolonged course of distemper illness and recover completely without any further nervous symptoms.

On the other hand, we may find that a proportion of these cases which start with hysteria do actually develop nervous complications before the full course is run and die in the later stages. Viewed from the point of view of resident virus, as mentioned by Professor Dalling, this raises an interesting point. From that angle it would seem that virus already present in the brain substance is stimulated temporarily by the temperature rise to give the two types of hysteria attack and that the fits which develop later are due to the distemper virus reaching the brain and these fits bear no relation whatever to the previous hysteria attacks.

It is always disheartening to the clinician to see fits develop in the course of a distemper attack. It does sometimes happen that a dog has one or perhaps two fits and after a few days develops a certain amount of lack of co-ordination. He may then proceed in quite a normal way to convalescence and after prolonged rest and suitable treatment, actually in the case of a racing greyhound, race as a normal dog. It will be appreciated that the damage done in such a case is relatively small and the degree of staggering relatively light. Other dogs are left with a twitching ear or group of muscles. Such dogs are irritating to me as pets and not satisfactory in the greyhound as a racing proposition.

When fits supervene on one another at short intervals the patient usually dies from exhaustion and it is a relief to see him dead. It is always a matter of interest to me to note that such a dog does actually die from exhaustion and never seems to breathe his last during the course of a fit.

From the nursing point of view there are two predominant symptoms that I have noted which indicate the possibility of fits supervening. The first one I see is often a dilation of the pupils giving an apparently thriving case a glassy stare. The other most prominent feature is seen in the temperature chart and here I would plead, for those interested, to keep one for each case as I consider that much can be gleaned from the keeping of a carefully taken temperature chart. The failure of the temperature to drop to normal when the physical symptoms would appear to indicate that it should be so, is often a sure guide of trouble to follow. Sometimes a dog may go through a secondary course of complications and after four or more weeks appear to recover and be very well. But the temperature record may show that he is running a temperature of half or one degree above normal and eventually he goes down with fits and dies.

We are familiar with the appearance of fits at other stages of the illness and I would do no more here than ask Professor Dalling to do his utmost to help along any investigations concerned with virus diseases affecting the central nervous system. I have seen no cure and little alleviation. In my view there has been no progress made in this line during my lifetime.

Respiratory Disease

By far the most common of the complications following virus infection is broncho-pneumonia; in fact, I have come to the stage where I am extremely doubtful about a dog having had distemper if it has not had pneumonia with it. It is not absolutely clear why it should be so. It is thought that organisms lying passively in the respiratory tract are probably activated at the time of the virus infection. It is true that if batches of susceptible puppies are kept together in compounds and all are injected with virus, the puppies in one compound are likely to show nasal discharge teeming with organisms of one type whilst those in other compounds have equally profuse nasal discharge but containing differing types of organism.

My interpretation is that infected (distemper) dogs cross-infect one another very quickly from the time of the first tissue reaction in the lining membranes of the nostrils—that is when we notice clinically the watery discharge from the nose. Organisms of unknown pathogenicity as well as virus take part in this exchange.

My explanation of the broncho-pneumonia and its appearance at a later date as a secondary condition is this: from time of infection by the virus the tissue reaction is spreading from nostrils to throat (husky cough) and from throat to bronchi and eventually to bronchioles. This takes over a week. Temperature begins to rise again and we see symptoms of pneumonia developing with laboured breathing and prostration.

Within a day or two after intense discomfort the first sign of nasal discharge appears—and we welcome this, for failure to discharge is likely to lead to hepatization or abscess formation and death.

All this reaction in the respiratory tract is ectodermic—of an external nature. The intense discomfort is doubtless due to the alveolar tissue reaction plus the presence of multiplying bacteria (which have accompanied the spread of disease up the respiratory tract).

It is also the case that when distemper breaks out in a large kennel of hundreds of dogs the susceptible dogs all go down with distemper and all show the same type of illness, *e.g.*, ulcerating mouths, particularly severe pneumonias, etc., common to the epidemic. Yet amongst these at times virulent cases, there are immune (vaccinated) puppies and immune (recovered) adults which cannot become infected by natural means. The vaccinated immune puppy is interesting for he has never had any sort of illness. Swabs from his throat will show B.H.S. and the same organism may be found in the throat of the violently ill pneumonia case. Further, it is my experience in watching greyhounds from birth to adult death that none which has gone through the hospital with a broncho-pneumonia ever goes back there with a broncho-pneumonia again.

Perhaps we may have an explanation to-day why this should be so. Why does a virus, plus broncho-pneumonia, showing organisms of one type seem to give immunity to broncho-pneumonia no matter which bacteria are involved? Why is it that a puppy never ill in his life will not become infected by supposedly pathogenic organisms in their most virulent state teeming from a dying dog? What is the true significance of these organisms when we know that the simple injection of virus material free from these will give a tissue reaction and immunity to them?

Conversely, most of us know that treatment of these broncho-pneumonias is notoriously uncertain. We inject anti-*bronchi-septicus* serum, anti-*coli* serum, anti-distemper serum and many others with most disappointing results. Are we not obviously wasting our time when we know that our immune (virus) puppy cannot take it and that his serum has some antibody content *other* than that from all the various organisms which gives him immunity to them? It may be said that the puppy's serum is only the same as ordinary anti-distemper serum taken from a hyperimmunized dog. But is it? Is it not the case that there must be some physical reaction visible or otherwise in the individual dog before he himself becomes immune and that no amount of injected immunity will immunize him without physical reaction?

In my opinion, therefore, however bad the pneumonia may be and after spending hundreds of pounds on various anti-sera, those of us who continue are wasting our time. I consider that the result of a distemper pneumonia is predetermined from the start; that the only answer to the question of recovery lies in the ability of the individual dog to produce its own successful reaction to distemper virus, that the only way we can assist apart from dietetic and nursing care in the later stages is by giving

really massive doses of high antibody content anti-distemper serum right at the start.

With others, I have believed that I have, by anti-bacterial serum injection, pulled a dog round, but by now I am converted. I have sadly to report that by far the greater part of it was wasted as was also many hundreds of c.c. of anti-distemper serum that have been injected into dogs in the later stages of the disease. I have had the opportunity to use many of the various sulpha drugs and think that my best results have been got by the use of sulphadiazine.

Nevertheless the results are still not good and do not really offer any stable hope.

We can expect soon to give penicillin a trial. But if the secondary organisms have no real significance at all and if distemper virus is not penicillin-sensitive we have one more disappointment in store.

Alimentary Complaints

Furring of the mouth and ulceration of the tooth enamel and gums are a frequent accompaniment to distemper. In my experience few distemper cases retain clean mouths throughout the attack—and the converse is largely true, too, that the brown furring of the teeth occurs rarely in the absence of distemper. The furring itself is harmless enough, but ulceration of gums and cheeks can be very serious. Quite extensive areas may be destroyed and the dog's feeding powers affected. Treatment by hypochlorite is the most satisfactory in my hands.

Vomiting is given as one of the classical symptoms following distemper infection, but I think, perhaps, it is connected with diet. In the greyhound kennel where diet is more or less carefully watched it is almost a certainty that a dog which runs a temperature and vomits is not taking distemper. Inappetence, however, is common.

Diarrhoea is always present as a complication in distemper and it is my custom not to worry unduly about it. Whatever the treatment, the diarrhoea seems to persist until the dog has passed the crisis, then, even in the absence of treatment, the faeces become gradually more formed and eventually normal. Efforts should, of course, be directed towards prevention of excessive straining. This on occasion leads to prolapse. I believe in attention being given to the anus throughout the disease. Sulphaguanidine or sulphapyridine are both useful drugs for bowel symptoms and are a great advance on drugs previously used.

Diseases of the Eye

Ocular discharge invariably follows on virus infection. It may vary from being merely a speck of pus in the inner canthus to profuse lachrymation and discharge. Keratitis is fairly common as also is ulceration of the cornea. These conditions yield to treatment as a rule, but sometimes the ulcer spreads, the anterior chamber protrudes and bursts, and the sight is lost. Mercifully this condition does not seem to occur in both eyes.

Skin Diseases

It is usual in a febrile dog confined without exercise over a period of five to six weeks to have various eruptions break out over his skin. The small pustules which may appear on the almost hairless areas between the hind legs are not always present and, therefore, not diagnostic. When present they offer no serious treatment problem and usually peel off. There is, however, a condition which occurs in dogs and in which large areas of hair peel off after a primary erythema. The answer to this is probably to be found in the severity of the illness and general physical disturbance. It is not a serious complaint though somewhat unsightly, especially to an owner! The convalescent dog is always likely to have skin lesions. Apart from the fact that there has been systemic disorder the recovering dog is probably receiving more protein than his system can deal with. He becomes similar to the horse, exposed to risk of lymphangitis, and the skin erupts. I cannot recall seeing any permanent injury to the skin following distemper complications.

Heart Affections

These do not appear to be common following distemper. As far as I am concerned, I see racing greyhounds recover from extremely severe distemper complications and go faster and faster speeds and live to quite a ripe age. Nevertheless, I see quite a number of vegetations on the heart valves of dead greyhounds and I must assume that since these are likely to have arisen from some severe illness there is every chance that distemper has had some part in it.

Nephritis

Nephritis, as a secondary condition is, in my opinion, rare. Mild attacks of albuminuria do occur but here again I get practically all my nephritis cases in the aged dogs. Frequent Heller's tests do not give us many positive reactions.

I cannot leave the story of the post-distemper disease without recalling the most weird of my experiences—and all have been "nervous type" cases. Twice I have seen dogs walking about at intervals for 24 hours on their forelegs with the hind legs carried in the air. I have seen progressive paralysis in a terrier which started with slight loss of co-ordination and ended with paralysis of all four legs and the puppy progressing quite quickly along the floor by extending the neck, fixing the chin and then contracting the neck muscles. I once attended a Labrador retriever which developed severe irritation, after distemper, in its tail. It chewed its own tail nearly off about three inches from the root and then chewed up an enamel basin, finally taking fits and dying.

Lastly, I think I have made it quite clear that from my observations on conditions as they arise, good nursing with all that it implies is the basis of our most successful treatment in post-distemper diseases. I consider that much of our syringe work is wasted effort, and that the main hope of good work being done in this field lies in the early resumption of issue of Laidlaw-Dunkin material by Burroughs Wellcome. May they not be too long.

We can expect some help from the sulpha drugs and perhaps, too, from other products, but in my opinion our successful future lies in vaccination and immune serum.

General Discussion

Dr. J. T. Edwards: He would like to amplify the admirable survey presented by the opening speakers in one aspect, namely that regarding *Br. bronchiseptica* invasion. Any laboratory worker who had had experience with the organism could not but be profoundly struck with the resemblance between it and the other Brucella organisms, *Br. abortus*, *Br. melitensis* and *Br. suis*. The resemblance between the cultural, bio-chemical and pathogenic characters of *Br. bronchiseptica* and the others was indeed very close. It would be recalled that it was in the year 1917 that the American worker, Alice Evans, made the striking pronouncement that what had been called *Micrococcus melitensis* and *Br. abortus* were nearly related and almost the same thing, and that *Br. bronchiseptica* was also closely related. When one appreciated the fact that *Br. bronchiseptica* was a *Brucella* the clinician could readily understand why the bacterial invasion in distemper was singularly intractable to chemotherapeutic treatment. He also examined 200 to 300 strains of *Br. bronchiseptica* and only once or twice had he seen a close antigenic resemblance.

While he was a colleague of Prof. Wooldridge, he spent a year on distemper at the college at a time, in 1913-14, when it was generally thought the cause was actually *Br. bronchiseptica*; it was hard to disprove it. The organism could indeed be recovered in massive pure culture from the whole of the respiratory tract as well as the other internal organs, but after massive inoculation with cultures the puppies could be made afterwards, on natural exposure, to suffer from a mild febrile disease which we now knew from the later researches of Laidlaw and Dunkin to be the initial virus attack of the distemper. Many years later, in work not yet published, he was able to establish the relation between virus infection and *Br. bronchiseptica* infection, working with an entirely different virus—the virus of foot-and-mouth disease—and on another species, namely the hedgehog. Hedgehogs were affected more severely by the foot-and-mouth virus than any other species of animal, and in them the disease resembled in many respects acute distemper in puppies. The technique adopted was to excise on successive days after infection the turbinates on one side for virus titration and cultural examination, and on the other for histology; lungs and other tissues were also examined similarly. The turbinates in hedgehogs were remarkably free of bacteria, but varying with the season of the year, a proportion were found to carry *Br. bronchiseptica*. Four days after the virus infection the turbinates started to get a heavy infection with *Br. bronchiseptica*: the organism then worked its way down into the lungs *via* the bronchi and a severe broncho-pneumonia developed, the virus as the stage was reached when the bacterial infection became massive, disappearing gradually from the lungs. *Br. bronchiseptica* having followed on the heels of damage caused to the respiratory epithelium by the virus, one discovered next in sequence, on rabbit inoculation, a pasteurella invasion. The older history of distemper research, even before *Br. bronchiseptica* came into the picture, showed that Lignieres claimed that a pasteurella organism was the real cause of distemper. This claim was disproved later by Carré, who first incriminated a virus as the initial cause. Later, in sequence, came streptococci—in a graded series of mounting virulence—ending up with haemolytic streptococci causing intense ulceration of the membranes and finally death. At different seasons of the year, as already said, the turbinates were carriers of *Br. bronchiseptica*, particularly in the colder seasons, to the extent of 30 or 40 per cent. During the dry seasons the turbinates seemed to shed themselves of infection. When the virus infection lowered the resistance of the animal these subpathogenic organisms in the nasal mucosa exalted themselves in virulence. Hence in experiments in which infection was propagated through successive lots of hedgehogs, *Br. bronchiseptica* was also found to increase rapidly in virulence until death took place at a very early stage after exposure from a severe bacterial infection in which it became eventually impossible to detect any virus, the bacteria having "raced out" the virus. These laboratory findings, in which the relationship between the virus infection and secondary, bacterial infection was accurately traced were interesting in the light of Mr. Bateman's extremely valuable clinical observations. He told them that the distemper picture was not one which was pure virus infection by any means. As in influenza, of man and piglets, it was recognized that the virus in itself might only cause a very mild initial febrile condition. So it was with distemper—one got immediately following it the *Br. bronchiseptica* complication of pasteurella, and streptococci invasion in succession, which from the clinician's point of view might be far more prominent

than the virus infection itself. The key to prevention was provided, as Mr. Bateman had rightly said, by averting the initial virus infection.

Could a *Br. bronchiseptica* infection take place without an initial virus infection at all? It was believed at one time that it could not take place and that it was necessary always to have virus infection. More recent work had shown that in conditions of overcrowding and a high relative humidity one could readily observe a *Br. bronchiseptica* infection, producing disease of rising clinical intensity without the necessity for an initial depression by a virus. With swine fever we had experienced a similar evolution in our outlook on the relationship. There we had pulmonary disease in which a pasteurella was long incriminated as primary causal agent, and an intestinal disease in which another kind of organism (a salmonella) was incriminated. Later on, after Dorset's discovery of the virus, it was believed by some that these bacteria could not set up disease without the initial virus attack. Now it was well recognized that that view needed considerable modification. Prof. Dalling had said that research work into distemper must be regarded as a natural concern, to be pursued afresh with vigorous concerted effort, by continuing from Laidlaw and Dunkin's classic researches which really mark only a beginning of what needs to be known. There was an enormous lot more to know about it. In these remarks he (Dr. Edwards) had not touched on the changes which might take place in the virus itself, nor on the complicating organisms, which gained entry *via* the intestinal tract. These, and several other problems, which had to be dealt with in the field needed, it was now clear, prolonged research.

Prof. G. H. Wooldridge: Arising from what Dr. Edwards had said on the association of *Br. bronchiseptica* with distemper virus, he did not think it was a matter of recent observation that *Br. bronchisepta* was capable of producing primary disease independently of the virus. For many years he had taught that, and in his encyclopoedia he had described the condition of contagious broncho-pneumonia as a separate entity. He had made many observations in connection with dogs coming from the Battersea and others dogs' homes. He knew numerous instances of dogs immune from distemper; they had been affected and recovered and resisted infection when subsequently exposed in the normal way. Later, after contact with broncho-pneumonia infected dogs they developed a cough in 48 to 72 hours, and this condition of broncho-pneumonia due to that particular organism supervened. He thought they had a commoner example in their kennels—the so-called kennel cough—a dog immune to distemper frequently going down to mild or severe attacks of kennel cough and, in his experience, due to the same organism.

As to the use of serum, he did not agree with Mr. Bateman. The serum was of great service if used in the early stages, but only in the early stages, as a preventive agent. He made a practice that if one dog in the kennels developed a cough he took the temperature of others and gave all an injection of distemper anti-serum while the older dogs frequently had *Br. bronchiseptica* serum with satisfactory results. Broncho-pneumonia they found was likely to be fatal. They found older dogs more likely to go down to attacks of broncho-pneumonia than many younger dogs. He thought Dr. Edwards would remember that in observations on distemper before the French investigations were published, he (Prof. Wooldridge) mentioned these organisms were secondary organisms and not the primary cause of distemper, and he thought virus was involved. He believed that broncho-pneumonia did frequently occur in young dogs directly as a complication to virus distemper, and he thought it also occurred independently of any primary infection. The same thing held good in respect of many of the intestinal complications—acute diarrhoea and abdominal distemper were due to organisms stimulated to activity as a result of primary virus infection. In other instances with no virus at all, infection with virulent strains of the same organism would set up acute intestinal trouble. There again one might get severe diarrhoea as a sequel or a complication of distemper, or it might occur independently of distemper and due to the same organisms when increased in virulence or with reduced resistance on the part of the patient. The question of skin lesions raised by Prof. Dalling was very interesting and a change of attitude. When Laidlaw and Dunkin's work commenced there was a lot of controversy as to whether the particular lesions of the skin were specific to distemper. Dunkin told him they were specific to virus infection and he (the speaker) said he did not believe it. Dunkin subsequently confirmed his view. Skin lesions were sometimes a sequel to distemper, and might be met with. They were more in the nature of a form of shingles where the nerve involved was in one of the limbs, sciatic or popliteal, and the ulceration ran down one or other of the limbs along the course of the nerve. As the nervous system improved the local lesion improved. The condition of brown mouth he did not think had anything to do with distemper. He thought it was a vitamin deficiency, probably vitamin B.

Major L. P. Pugh said that he was in entire agreement with Professor Dalling and Dr. J. T. Edwards when they advocated further research into th pathology of and the sequelae to canine distemper. As clinicians they all admitted the great benefit that followed Dunkin and Laidlaw's work, but they at the same time had to emphasize that distemper as occurring in the field was a far more complicated problem than even these eminent workers thought. Clinical and pathological observations on encephomyelitis following distemper led one to suggest that there was at least one other virus commonly involved in this problem besides the Laidlaw-Dunkin virus. He had suggested on previous occasions that the fact of Laidlaw and Dunkin relying entirely on the ferret to collect their virus might have led them to miss other viruses not transmissible to the ferret. H. G. Green and his co-workers in America had clearly demonstrated that such was the case in the fox. They had also to bear in mind that Laidlaw and Dunkin had never been able to reproduce the pathological picture met with in encephomyelitis of "street" canine distemper. In these circumstances he hoped that all clinicians would support keenly any further researches into this problem that might be undertaken in the future.

Dr. Hare said that he would refer to some important evidence which had been omitted by Professor Dalling. The more senior Fellows of the Central would recall that over 30 years ago some of their more observant colleagues, headed by the late Henry Gray, had drawn attention to the prevalence of a "distemper-like" infectious disease of dogs which occurred independently of the virus of canine distemper. About 20 years ago Henry Gray repeated his challenge to the orthodox text-book descriptions of canine distemper at the Central's discussion of the late Sir Patrick Laidlaw's paper describing his and the late George Dunkin's observations on the properties of the virus of distemper. Throughout the world it was agreed that the Laidlaw-Dunkin virus vaccine conferred a durable immunity to the virus of canine distemper. Consequently any infectious illness appearing in dogs subsequent to their immunization by the Laidlaw-Dunkin method was not due to the virus of canine distemper. Largely through the painstaking work of Professor Dalling the Laidlaw-Dunkin method had been developed commercially as the Burroughs Wellcome virus vaccine, which was widely accepted as one of the most successful products in the whole field of immunology. Along with the successful immunization of many thousands of dogs in Great Britain by the Burroughs Wellcome virus vaccine came the recognition by veterinary practitioners that these dogs remained susceptible to the "distemper-like" disease, to which Henry Gray had first drawn attention. Further confirmation of Henry Gray's prescience came from the publications by various authors since 1938 on the *beta haemolytic streptococcus* (B.H.S.) infection of dogs. Recently in presenting to the Central (*The Veterinary Record*, 1946, **58**, 177) a report on the analysis of 400 cases of the B.H.S. infection, the majority of which had been immunized by the Burroughs Welcome virus vaccine, he (Dr. Hare) had produced the evidence for regarding the B.H.S. infection as a specific contagion independent of, and capable of being differentiated from, the specific infection due to the virus canine distemper as defined by Laidlaw and Dunkin. It would not detract from the debt owed by the world to pathologists from Carré to Laidlaw and Dunkin to emphasize that, largely due to the British clinical method, what had passed in the text-books as canine distemper was now separable into two specific contagions, one due to the virus of distemper, the other due to the B.H.S.

He understood Professor Dalling to allege that the most prevalent infectious disease of dogs to-day was due to infection by "secondary bacteria" superimposed upon infection by the virus of distemper. He found extreme difficulty in understanding how Professor Dalling reached such a conclusion on the evidence presented in his paper. The evidence comprised the results obtained by Professor Dalling at the *post-mortem* investigations of dogs which clinically had been diagnosed as suffering from the "pneumonia of canine distemper." Incidentally, he did not hear Professor Dalling state how many of these dogs had been immunized by the Burroughs Wellcome virus vaccine. He understood Professor Dalling to say that "secondary bacteria," but not the virus of canine distemper, had been recovered from the pneumonia cases. Nevertheless, Professor Dalling assumed that the virus of distemper must have been present. He suggested that Professor Dalling was not entitled to assume the presence of the virus of distemper; the obligation on the pathologist was to demonstrate the virus, if in fact it was or had been present, by biological and histological means. If by biological and histological investigations of the pneumonia cases Professor Dalling failed to demonstrate the virus of canine distemper the reasonable inference was that the clinical diagnosis of canine distemper had been a mistake.

He thought Professor Dalling must be hard pressed when, in the defence of the outworn text-book descriptions of canine distemper, he alleged that the virus of distemper increases the virulence of the "secondary organisms." He invited Professor Dalling to produce the evidence for this claim. To him (Dr. Hare) it seemed mere bacteriological jargon. Could Professor Dalling produce evidence to show that the B.H.S. without activation by the virus of canine distemper or any other virus was incapable of producing specific injury and illness? Or did Professor Dalling apply his notion solely to *Br. bronchiseptica*? He (Dr. Hare) was reminded how very rarely of recent years he had succeeded in isolating this organism from tonsil swabs and at autopsy compared with some 20 years ago when *Br. bronchiseptica* infection appeared to be more prevalent. The very infrequent isolation of *Br. bronchiseptica* in routine work was retarding the correct assessment of its pathogenicity and epidemiology.

One of the major defects of Laidlaw and Dunkin's work was their failure to correlate their observations on the behaviour of the virus of distemper with adequate histological demonstration of its activities and specific lesions. Since then much useful work had been done on the histology of the virus infection by Perdrau and others. It was one thing to recover the virus of distemper at a certain stage of illness from any tissue of the body; it was another thing to demonstrate the injury produced by the virus in tissues outside the nervous system. The encephalomyelitis produced by the virus of distemper was demonstrable clinically and histologically; but were these criteria satisfied by Mr. Bateman's cases? Had Mr. Bateman excluded the possibility of his "brain cases" having been spasmophilia due to such causes as bacterial infection complicated by bowel parasites?

Whatever differences in experience and process of thought arose in the present discussion, all Fellows were united by acute anxiety over the impending stoppage in production of the Burroughs Wellcome virus vaccine. He hoped Professor Dalling would be encouraged by this discussion to draw the Ministry's attention to the grave position facing the profession and dog industry.

Mr. F. C. Gillard: Most, if not all, of these problems owed their significance to the destructive action of distemper virus. If we could eliminate distemper virus either by successful prevention or by cutting short its damaging effect by a more effective serum, he thought they would hear little of bronchisepticus encephalitis, chorea and other so-called diseases.

In regard to inoculation against distemper, most veterinary surgeons had in the past practised one or other of two methods—vaccine followed by virus—virus followed by serum. A great deal of criticism against inoculation had in the past arisen, probably on account of (1) extraneous organisms gaining access to the agents used during their manufacture; (2) the variable potency of the virus; (3) the technique employed in using those agents; (4) inoculating the patient either during the period of incubation from natural infection or to exposure to infection after inoculation but before immunity had been established.

A client of his, a good many years ago, who had a large kennel, and who had been unfortunate in that on a number of occasions fits occurred after inoculation, refused to have virus introduced. He then suggested two injections of vaccine at an interval of a fortnight and over a number of years; in spite of her dogs visiting shows all over the country and bitches coming from many kennels to the stud dogs, they had no outbreak of distemper.

After some years he changed over to the method of vaccination by virus followed by serum. Many practitioners introduced these two agents simultaneously. Personally, he considered an interval necessary and allowed an interval of a quarter of an hour, gradually extending the period even up to 24 hours, and with the exception of two positive breakdowns—both of which followed short interval inoculations—he had no reason to regret adopting the procedure of giving the virus all this start—neither of the two exceptions proved fatal. He knew others had many breakdowns with the virus serum simultaneous inoculations and he had always thought that perhaps cutting short the action of the virus immunity was not fully established.

In 1943 when the Burroughs Wellcome Laboratory was in trouble and when again one heard of so many failures, he switched over to the method previously described of two injections of vaccine, and a very large number of puppies had been so inoculated since that date without one single breakdown so far as he had been able to ascertain, so he did think this method should receive more attention.

Other veterinary surgeons had, he knew, adopted this double method of vaccination by two doses of vaccine, but he thought it was exceptional.

There was a tendency to regard secondary conditions as distinct diseases due to organisms which were accompanying such conditions, instead of considering them to be sequelae to distemper virus infection.

Mr. L. Geffen: He had known only one case of double vaccination in which

there had been a breakdown, although other cases might have occurred amongst dogs that he had vaccinated and might not have been brought back to him.

The case in point was his own pup, a Gordon Setter, purchased on November 1st and being five months old at the time. On November 2nd he gave 5 c.c. Burroughs Wellcome distemper vaccine and repeated the dose on the 14th day. On December 1st he attempted to immunize the dog against secondary invaders by the Bayer method, Caniseran followed by Yatren at ten days' interval. On December 24th he gave 10 c.c. Burroughs Wellcome anti-distemper serum. The dog was exhibited in a show on Boxing Day and by January 1st was showing all the symptoms of an acute attack of distemper. Later, after careful nursing, more serum and massive subcutaneous injections of glucose saline had apparently effected a cure, the dog showed all the symptoms of bronchisepticus and *B. coli* infection. These were treated by injections of the appropriate sera. The dog had recovered.

As regards the simultaneous method of immunization, he believed he was right in stating that when Professor Wooldridge taught him medicine at the Royal Veterinary College, he stated that it was immaterial as to whether the serum was given, followed within 24 hours by the virus, or whether the virus was given first and followed within 24 hours by the serum.

He had had several cases where after immunizing an apparently healthy dog by the simultaneous method, there had been definite symptoms of distemper between the fourth and seventh days, but had found that these cases always yielded well to a large injection of serum. He had only had one mishap with the vaccine-virus method, this in an Irish Setter, which, six weeks after immunization, was attacked by distemper, which started a normal course, and being followed by chorea and hysteria, ultimately had to be destroyed.

Mr. S. F. J. Hodgman: Personally he used the serum-virus method, but he thought a lot of its success depended upon the technique. Whatever inoculation one was doing, vaccine-serum or virus-serum, one must first be certain that the dog was fit. In the ordinary vaccine-virus method he found it was absolutely impossible to get his clients to isolate their dogs for the required period, *i.e.*, a week before, and during the period of, the vaccine and virus inoculation.

On the other hand, with the serum-virus method, he found he could get owners to isolate for about 14 days. He had the temperature taken night and morning for a week and, if the result was satisfactory, he gave virus followed by serum, two, three or four hours afterwards, the temperatures being taken as before during the following week or ten days.

He had seen cases with a rise in temperature on the fourth or fifth day, a definite rise to 103° or 104°, afterwards dropping to normal. If the patient remained normal he concluded there had been some form of effective immunization and he gave the O.K., but, should the temperature go up and remain up, he concluded that the patient had gone down with distemper through the virus injection. In these cases he gave another dose of serum, 10, or sometimes 20 c.c. and, if the temperature fell and remained down, he considered the inoculation effective. In these latter cases the virus got the upper hand of the serum, but an adjustment could be made by the help of the temperature control.

Professor Wooldridge: In respect of the period which might be allowed to lapse in the use of serum and virus, Laidlaw and Dunkin injected virulent virus followed with serum 24 hours later, which invariably overtook the virus and no ill effects resulted. His own experience ranged round different methods recommended, and he used to give serum one day and virus the next, or virus one day and serum the next, and in the end he resorted to giving virus and serum at the same time and the same visit. It did not really much matter if the serum was first or the virus or both injected at the same visit. Laidlaw and Dunkin originally injected virus intracutaneously at the withers. The idea was that the virus would not be distributed throughout the body too quickly, and there was not so great a danger of distemper following the use of serum subsequently. That was found unnecessary. His own practice was to make one visit sufficient. He insisted on temperatures being taken, particularly four or five days after injection, and if any dog had a temperature of 103° F. he gave another dose of serum. He thought that a safe and wise plan.

Mr. A. Sams: His experience followed closely that of Mr. Bateman. In the past he had been a big user of serum, but recently he had not had such good results. Their virus might have been different from the one being used to produce the serum. Before the war he had the distemper situation well in hand. Young greyhounds likely to go down with it were given 20 c.c. on arrival. They had a big staff and temperatures were taken every evening, and if found to be over 103°, 40 c.c. of serum was given. He would be very glad when serum was back on the market, for if it was not completely successful it was better than nothing at all.

Mr. E. R. Ambrose: Were they dealing with different viruses? All the afternoon he expected someone to make reference to the so-called Continental distemper. He thought that from the clinical standpoint they were dealing with virus of greater virulence than that known hitherto and that might be the cause of some of the cases in which Burroughs Wellcome prophylactics had not given solid immunity. He believed it was agreed among practitioners that recent outbreaks of distemper were not among those dogs vaccinated pre-war, but that those vaccinated during the war had not stood up to infection later with distemper. They so seldom got catarrhs, but instead temperatures which nothing on earth seemed to reduce and then nervous symptoms developed.

Mr. Gillard had mentioned double vaccination. He endorsed his remarks: not that he thought one might be fortunate enough to gain complete immunity from double vaccination, but he had seen distemper breaking out in kennels where dogs that had been double-vaccinated had developed distemper and had recovered possibly with no treatment, whereas other dogs in the same vicinity had gone down in the usual way. He was not absolutely certain the difficulty was as Burroughs Wellcome explained. He understood the difficulty was producing the virus to a definite date. If this was so, one might put forward a plea that they should continue producing vaccine for some considerable time and in considerable bulk so that they could go on giving and using the double vaccine method, with the hope of giving a certain amount of immunity and explaining to clients that they must not expect a full immunity.

Dr. G. B. Brook: There were probably several diseases so closely allied symptomologically to distemper that their differentiation on clinical grounds alone was quite difficult. This was especially true of fits or "hysterical outbursts" in young dogs and a rapid diagnosis and prognosis was particularly important in that the owner often demanded destruction of the patient unless the veterinarian could promise to prevent a recurrence of the attacks. Such a promise depended on the question as to whether the fits were or were not those of distemper. If of the former type, they were usually incurable; if of the latter, he had found that a high proportion responded to the subcutaneous, more often the intravenous and sometimes to the subarachnoid injection of calcium and magnesium, with the addition to the diet of cod-liver oil and vitamin B_1, together with restricted exercise. In his hands this therapeutic test had reprieved many a condemned puppy and paved the way to permanent relief.

A second point of interest concerned the cerebrospinal fluid of patients which exhibited typical symptoms of nervous distemper. C.S.F. had been collected from 12 such cases at the height of the attacks. Laboratory tests failed to detect virus in any of the specimens, so that this procedure was not likely to be of clinical value.

Distemper might be followed by progressive loss of condition, cough and chronic diarrhoea and great weakness. When all the usual remedies had failed the administration of "Enterofagos" had sometimes turned the balance in favour of the patient.

Finally, he would like to refer to persistent nasal discharge as a sequel to distemper. This was rather rare, but when established was a great problem to the owner on hygienic grounds, so that cure or destruction were the only alternatives. Such a case was explored surgically last summer by Miss J. Bannister, M.R.C.V.S., and himself in the practice of Auchterlonie and Williams. After reflection of the skin, the anterior two-thirds of both nasal bones were removed to gain access to the nasal cavity. The four turbinate bones, the majority of the nasal septum and parts of the ethmoid mass were resected. Recovery was uneventful. He had not received a report on the effects of the operation, but mentioned it to show that the nasal cavity of the dog could be entered by this route and structures therein removed. The turbinate bones particularly, in this case, showed necrosis and ulceration.

Fits or hysteria in the dog and their relation to Ca/Mg therapy seemed to him to be very important in practice, and it was hoped soon to publish a detailed report on this subject.

Dr. R. F. Montgomerie: It was obviously very difficult to stick to the subject under discussion and, like others, he would find it difficult to avoid wandering to related matters. Few would disagree with the dictum that the nervous affections following distemper were the most distressing sequelae and the most difficult to treat. He was somewhat surprised to hear it suggested that the nervous manifestations of distemper virus infection might appear in the very early stages. That was contrary to his experience. He recalled instances in which it was reported that the dog went into a fit within a few days of injection of virus. He even remembered a case in which nervous symptoms appearing within an hour were ascribed to virus infection. He doubted if this type of symptom was ever caused by virus infection until many days had elapsed; the dog in the meantime having gone through the typical physical phase. They must agree that other causal agents caused nervous disease in dogs—disease which they could not readily distinguish from the post-distemper condition. Whether some of these agents were virus they could not say, but Professor Dalling might have been near the mark when he suggested that distemper virus infection might precipitate the appearance of nervous symptoms, caused by some other agent, possibly a virus previously dormant. He heartily endorsed the plea for more research work on this very complex problem.

The second post-distemper complication mentioned was the frequent pneumonia syndrome. He had always believed that virus infection did damage to lung tissue and opened the way to secondary invaders, among which *B. bronchiseptica* and streptococci were the most common. Dr. Hare's contention that whereas bronchiseptica used to be the usual damaging secondary it was now relatively infrequent and second to a streptococcal invasion in its importance was most interesting. He had not kept records which would help to decide that point, but on general observations he believed there had been a change in that direction.

Mr. Bateman had contended that a dog which was immune to distemper could be exposed to any infection in his kennels and always remained well. This seemed to be an attempt to discount the importance of the bacterial infections. They all appreciated that Mr. Bateman, with his large kennel of dogs must, particularly under wartime conditions, have had a full share of difficulties. Possibly strains of bronchisepticus and cocci of low virulence had, in these conditions, had ample opportunity to set up very low grade infections which had resulted in a level of immunity sufficient to protect against more virulent strains. He hoped it was not going to be contended that the appearance of pneumonic disease in a dog was evidence that he was not immune to distemper; there was good evidence that *B. bronchiseptica* could and did set up the pneumonia they saw post-distemper other than as a sequel to virus infection.

Dr. Edwards's contribution was particularly interesting and valuable, but he was surprised to hear that he supported Mr. Bateman's view that bronchisepticus antiserum was of little value. He understood he gave his support on his classification of bronchiseptica as a *Brucella*. But one could get clear proof of the value of antiserum. Strains which set up a virulent infection in laboratory animals could be protected against by serum inoculation and quite clear evidence could be obtained of variation in protective power; an entirely different picture from that which was obtained with *Br. abortus*.

It was surprising to hear it suggested that virus could not be recovered from the lungs beyond five days after infection. This was not in accordance with laboratory experience.

There was always the wide open door which allowed the suggestion that some of the post distemper disease was due to a second type of virus. If one accepted as distemper virus a filterable agent which caused the characteristic febrile reaction in the dog and the typical disease in ferrets, then they could say that so far they had not encountered an antigenically different strain. Each new strain they had isolated had been protected against by the standard type of serum.

Mr. Bateman: He would like to know if Dr. Edwards could infect his virus immune hedgehogs with *Br. bronchiseptica*.

Dr. Edwards: Yes. Given favourable conditions it so increased in virulence that it was transmissible and it produced severe and even fatal disease without the intervention of any virus. That happened if he kept stocks of hedgehogs close together in winter time, and if he did not take care to segregate the experimental animals including those, in the cases of their own work on immunization, which had recovered from the various "types" of foot-and-mouth virus infection. If they did not take care to segregate the animals, preferably singly, or at any rate, in small groups, for their work, they were all likely to go down with *Br. bronchiseptica* infection. *Br. bronchiseptica* could thus of its own accord be the cause of severe and a fatal disease. However, if one cultivated the bacteria for a generation or two in the laboratory, one could inject into the nasal cavity a large quantity of what had been a virulent organism without producing disease. It rapidly lost virulence on culture. When Torrey claimed in 1910 that *Br. bronchiseptica* was the cause of distemper he was confronted with the fact that he could not produce distemper with cultures. He said the virulence of the organism was lost in cultures, and it was only the first cultures direct from animals that produced the distemper. They knew now that *Br. bronchisettica* even more so than pasteurella, was an organism that lost its virulence on culture.

Mr. Bateman: In their dogs they had not found any were down again with bronchopneumonia, nor had any efficiently immunized dog gone down with *Br. bronchiseptica*.

Dr. Edwards: Probably Mr. Bateman kept his dogs in ideal conditions. If dogs were not extremely well kept and were put in conditions where the bacillus found conditions more favourable for establishment massively in the tissues, then one would find one's virus-immunized animals would probably succumb to bronchiseptica alone.

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THE REPLIES

Mr. Bateman: All along, the idea of immunity to distemper was immunity to that condition characterised by nasal discharge, and it was always understood that in an immune dog the chances of his ever being off with a discharging nose were very rare. Kennel cough, he agreed, did occur, without nasal discharge and bronchiseptica might be implicated. He had had no success in the treatment of distemper cases with bronchiseptica serum. Gastric disturbance and diarrhoea, they were all agreed, did occur, but he did not consider that the skin lesions seen on the inner aspects of the thighs were in any way diagnostic. Clinicians generally were agreed that chorea occurred only after distemper infection and that they never saw it arising in a dog known to be immune to distemper. With regard to the possibility of hookworm being implicated, he could only say that he had many dogs infected at one time or another by hookworm, but he never saw fits followed by chorea develop unless the dog was actually suffering from distemper or convalescing.

With regard to Capt. Gillard's point, he must say he always had a fear of injecting live virus and leaving it to run loose in the subject for 24 hours before injecting serum. The virulence of batches of virus varied, and he knew that even when virus and serum were injected at an hour's interval, severe reactions might take place. The risk of delay in injecting antibody was very great in those cases. There was a case for the double vaccine method if the particular batch of vaccine was a good one, and if virus was to be met at an early date. Nevertheless, he had given greyhounds two doses of vaccine and failed to immunize them. He would, of course, support its use if live virus itself was unobtainable. He was afraid he had to admit that the circumstances in which he vaccinated would not suit Capt. Gillard, for he vaccinated his batches of pups on one day, left them to run about in paddocks of 100 yards or so and returned in a fortnight to inject virus. He had never considered that the exercise was harmful.

Reference had been made to a new type of distemper. His experience did not lead him to believe that there was such a thing. His view was that the story was probably connected with vaccination and that it was the name given by some to an ordinary attack of distemper following on vaccinated but not immune dogs. He had had that experience, but considered that it had been due to failure on his part to immunize the dogs.

Dr. Hare: "A particular failure on your part?"

Mr. Bateman: "I injected the material consigned."

Dr. Hare: Usually in failures the dogs had been in contact with virus infection. Unless Mr. Bateman had laboratory support he could not accept it. As an alternative suggestion one explanation was that Mr. Batetman's diagnosis was at fault. He was throwing criticism against the vaccine and it was a strong statement which Mr. Battman could not substantiate. He must bring forward his proof.

Mr. Bateman said he had infected ferrets with what was undoubtedly distemper.

Professor Dalling thought they had had a very profitable discussion. It had shown how little we knew. He hoped it would urge forward those who could bring pressure to bear in any quarter to stimulate people to work on diseases of the dog. There was a lot of discussion on the clinical side, which problem was dealt with by Mr. Bateman. He thought Dr. Edwards' contribution was excellent and would help a lot in understanding diseases not only of dogs, but of other animals. He was sure Dr. Hare would repeat his old conundrum about immunized dogs showing syndromes later in life. He was not going into that that day. He did not think we knew anything about it. He would like to clear up a point raised by Dr. Hare, and say that what he (Professor Dalling) had in mind in the recovery of the distemper virus in the respiratory tract was not in the five day case but in advanced cases. Of course one recovered virus from the lung of those dogs with pneumonia, but when the dog had been ill some considerable time it might be quite difficult to demonstrate that the virus was in the lung or other tissue. Where the virus went they did not know. Dr. Hare drew attention to the fact that they had not gone fully into histology. He (Professor Dalling) regretted having to say that none of them concerned with investigations had gone as fully into that aspect as they should, and he agreed that it should be one of the important things to be done if that study was renewed. Dr. Hare was worried about the increase in virulence of secondary organisms, and thought it was jargon. He had only to listen to Dr. Edwards to hear how *Br. bronchiseptica* became more virulent until the high state of virulence was reached when infection occurred without the presence of virus. That was the answer to that question. Major Pugh raised a question in connection with the nervous disease. He (Professor Dalling) had a sneaking feeling that more than one virus might contribute to these diseases, and he pleaded strongly for a thorough investigation into all diseases of dogs including the nervous system..

Dr. John Duckworth, Lecturer in Animal Husbandry at the Imperial College of Tropical Agriculture, stated recently that with proper management and feeding, there is nothing to prevent the successful development of a local dairy industry in Trinidad. This was concluded from the results of joint experiments with heifers of the tropical dairy type by Mr. A. P. McWilliam of the Government Stock Farm and himself. Experiments relating to the rearing of calves and feeding requirements for good growth formed the principal study in recent months.—*Colonial Office News Service.*

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Nearly 100 goats, practically the whole herd, have been stolen from an Argyllshire farm. The thieves are believed to have arrived in boats and removed the goats after shooting them.

THE VETERINARY RECORD

August 24th, 1946

PROFESSIONAL STATUS

Remuneration of the Royal Army Veterinary Corps

THE importance of proper professional status to the individual member of the profession is reflected by the recent announcement in Parliament and in the White Paper, Command 6750, of the new rates of pay for officers of the Royal Army Veterinary Corps. The scale shows an invidious distinction against the veterinary surgeon in the Army, a discrimination not only in favour of the medical man, with his comparable length and breadth of training, but also in favour of the dental surgeon, whose training is less extensive than that of the veterinary surgeon. Indeed, the total pay received by a veterinary officer over his first eleven years of service is less than that of the dental officer by £1,022, and that of the medical officer by £1,606 over the same period. This indefensible differentiation is aggravated by the fact that, whereas the medical and dental officers are promoted to the rank of captain after one year's service and to that of major after eight years' service, the veterinary officer requires two years for his captaincy and ten years for his majority.

It may be that the Government consider the reduced strength of the R.A.V.C. warrants discrimination, but in actual fact severe reduction in numbers makes the work of the professional man more difficult in that he does not have the same widespread facilities to aid him in preparing for the innumerable problems of war expansion. Nor is this attitude justified in the light of recent versatile achievements of the R.A.V.C. in the second World War; indeed, during this widespread campaign, after a difficult start, with an inadequate regular cadre, the Corps absorbed the remount services and later developed in many other branches concerned with the maintenance of an adequate and safe food supply for the Army.

These disquieting facts will strengthen the growing conviction within our ranks, that the official discrimination against the veterinary profession is not resticted to an isolated Ministry, but pervades many departments, not the least of which appears to be the Treasury.

There is now no doubt that the profession must present a firm and united front to combat this unworthy movement to lower the status of a learned profession. If we fail to obtain equitable treatment, both in the Army and civil ministries, future progress and development will undoubtedly be adversely affected to the detriment of agriculture and public health.

The proposed status of the Chief Veterinary Officer of the Ministry of Agriculture and the recently announced rates of pay for the R.A.V.C. form parts of a danger to the profession which we must resist to the utmost. Let us remember with Publilius Syrus "There is always victory where there is unity."

HOWARD WINNINGTON DAWES

President of the Royal College of Veterinary Surgeons, 1946-47

When the most democratic of all the Royal Colleges chooses a president it takes from among the members of its Council one who has gained experience by service, and has stood trial by election of all the Members of the College. Any man elected to the Council must have a sound veterinary background and the absolute confidence of the Members. Such a man is the new President.

Howard Winnington Dawes was born on November 29th, 1892, the son of the late H. J. Dawes, F.R.C.V.S., of West Bromwich, who was well known to almost every member of the profession not only as one of the foremost Midland practitioners, but as an examiner in Stable Management for many years. Dawes received his early education first at West Bromwich Grammar School and later at Denstone College, where in the Large Schoolroom his name stands high on the Honours Board.

From Denstone he went to the Royal Veterinary College, London, where his brilliant academic career was continued, and there he obtained Honours in every professional examination. During the four years of his curriculum he was awarded 20 Class Prizes, the Agricultural Society's Prize, the Walley Memorial Prize and the first Fitzwygram Prize, and he passed his final examination in July, 1913, although not yet 21 years of age.

After leaving College he became assistant in what was no doubt the greatest provincial practice at that time, that of the late Joseph Alcon, F.R.C.V.S., of Sheffield. Under the guidance of that kindly and eminent man he gained experience which has stood him in good stead for the remainder of his career. After four years of war service with the R.A.V.C. in France he returned with the rank of Captain to civil practice at the latter end of 1919 and joined his father in partnership at West Bromwich. The practice there was already a wide one, but with the enthusiasm and ability of the new partner it rapidly expanded in scope to embrace every aspect of the Veterinary Art, and the very large percentage of horse practice is still his own particular work. He is veterinary surgeon to several boroughs in the industrial Midlands and to some of the largest studs of horses in the country, where his specialized knowledge of the feeding, shoeing, and general management of the commercial horse is highly appreciated. His wide experience has been recognized by many of the Breed Societies and for 23 years he has been an Inspector of the Royal Agricultural Society of England and of the National Pig Breeders' Association. An acknowledged authority on the dentition of the pig, he is joint author with Mr. Brennan DeVine of several publications on the subject. He was elected to the Fellowship of the Royal Sanitary Institute in 1931, for which body he has acted as examiner in Meat Inspection. The Hackney Horse Society, of which he has been a member and Veterinary Inspector for many years, is perhaps the nearest to his heart. He has had little time for any hobby but horses and in his younger days was a keen rider. An excellent whip, he is now President of the Local Driving Club, and in his stables one can always find one or two first-class harness horses which he drives for his own pleasure. There are few show rings in which he has not appeared as judge, and in this capacity his services are in frequent demand and his opinions held in the highest repute.

Following in the footsteps of his father, Howard Dawes became Secretary of the Midland Counties Veterinary Medical Association. He was President of that Society in 1939, and has for many years represented the Society on the Council of the N.V.M.A. He represents the N.V.M.A. on both the Court and the Council of the Governors of the Royal Veterinary College.

In 1934 he was first elected to the Council of the Royal College of Veterinary Surgeons and has taken a very prominent part in its activities. His long experience as Chairman of the Examination Committee has given him an insight into veterinary education in its widest conception, and his business experience has been well applied to the work of the Finance and Library Committees.

Animal welfare, too, plays a big part in the life of the President. He is a member of the Council of the R.S.P.C.A., and of several of the Council's Committees, the work of the Birmingham branch being his especial care.

Such then is the background of the new President. With his engaging personality and the help of his charming wife the cares of the presidential office will not weigh too heavily upon him, for he knows that during the present year, perhaps the most critical in the history of the century-old Royal College, the full support of all his colleagues will be given to him freely, with that measure of goodwill which will unite and bring the profession nearer to the fulfilment of its most cherished ideals.

A. A. F.

Mr. William Geoffrey Ronald Oates

The Late Dr. F. Bullock's Successor as Secretary and Registrar, Royal College of Veterinary Surgeons

At the same meeting of Council, R.C.V.S. (that held on June 6th), as witnessed the election of Mr. Howard Dawes as President, Mr. William Geoffrey Ronald Oates, who for a short period following the lamented death of Dr. Fred Bullock had been officiating as Acting Secretary and Registrar, was appointed to succeed him as Secretary and Registrar of the Royal College. Mr. Oates has entered upon his arduous duties with zeal and it is with pleasure that we introduce him, as it were, to those—the great majority—of our readers whose knowledge of him as yet is limited to the information contained in the brief announcement of his appointment made in our issue of June 15th.

Mr. Oates, who lives in St. John's Wood, N.W.8, and is unmarried, was born on July 1st, 1909, the only son of Dr. G. E. Oates, M.D., M.R.C.P., Barrister-at-law. He was educated at Westminster School, Corpus Christi College, Oxford, and the Law Society School in London, besides spending considerable periods in his student days in France, Italy and Austria. He represented his School at fencing, and took part in many national competitions; while at Oxford he was cox of his College boat.

In 1931 he was articled to a London firm of Solicitors and was admitted as a Solicitor in January, 1936, taking Honours at the Intermediate and Final examinations. After a short time in private practice he was appointed Secretary to an institution that was concerned with medical education and postgraduate teaching, and held this post at the outbreak of war.

Mr. Oates had then travelled extensively in Europe and North Africa, and he speaks French and Italian fairly fluently. Being interested in English education he was a London County Council School Manager, while he was a frequent contributor to the foreign press on various aspects of education in England.

The utilization by the military authorities of Mr. Oates's professional experience ultimately made his service overseas of special interest. It was, however, as a Territorial "other rank" that he was mobilized with the London Welsh Regiment in August, 1939, and manned the anti-aircraft defences of London until December, 1939. He was then selected for a commission, and sent to the Honorable Artillery Company Infantry Officer Cadet Unit. From this he was commissioned as a 2nd Lieutenant in the Royal Welsh Fusiliers—his mother's family regiment—in April of 1940. He was promoted Captain and had the command of a company in August of the same year.

For the next two years he continued as a Company Commander in the same Battalion, serving in the English Channel Coast defences, North Wales and Northern Ireland, and then went as a Staff Officer to North Africa.

Having been selected as a Staff Officer for the Allied Military Government of Italy, after the landing at Salerno he served with

[*Mr. & Mrs. Sidney Darby and Son; West Bromwich*

HOWARD WINNINGTON DAWES, M.R.C.V.S.

President, Royal College of Veterinary Surgeons, 1946-47

the 5th United States Army during the winter of 1943-44, being mostly concerned in the prosecution of spies, and homicide by the civilian population against allied soldiers. On the fall of Rome he was appointed Deputy Regional Legal Officer in the general area around Rome and for Umbria.

In the autumn of 1944, after a special mission to Sicily, he joined the staff of the 8th Army, but as the expected break through did not take place was loaned to the American 5th Army, and acted as Judge for the City of Florence, where he tried some 1,200 cases. During the final advance and the break through into the Po valley, Mr. Oates, who had been a Major for about a year, was deputy Senior Legal Officer of the 8th Army. After the German surrender, until his demobilization at the end of 1945, he acted as Deputy Regional Legal Officer for the Venezia area of Italy, having particular care of the Italian judicial system, covering some five million people.

Thus accustomed as he is to the acceptance of responsibility, and with this record of his training and accomplishments in civilian life, we are sure that all members of the Royal College will acclaim the selection of Mr. Oates as one worthy to succeed to the onerous post so ably and conscientiously filled by the late Dr. Bullock, and will wish him happiness and success in his new sphere.

Meeting of Council, R.C.V.S.

Election of Mr. Howard Dawes as President

Mr. W. G. R. Oates Appointed Secretary and Registrar

An Ordinary Meeting of Council of the Royal College of Veterinary Surgeons was held at 10, Red Lion Square, W.C.1, on Thursday, June 6th, 1946, at 12 noon, Major A. B. Mattinson, O.B.E., M.C., M.A., F.R.C.V.S., D.V.S.M., retiring President, occupying the chair at the commencement of the proceedings.

The minutes of the previous meeting were taken as read and confirmed.

The Acting Registrar read the report of the meeting of the Selection Committee.

Professor Buxton: I beg to move that the report of the Selection Committee be accepted, and that Mr. H. W. Dawes be elected President for the forthcoming year.

Mr. Tutt seconded the motion, which was carried unanimously, with acclamation.

The Retiring President then, amid applause, vacated the chair and inducted into it the new President, congratulating him on his election and wishing him a happy year of office.

The President (Mr. Dawes): Major Mattinson and Gentlemen, I should like to express my sincere appreciation of the great honour you have conferred upon me by electing me to the post of President of the Royal College of Veterinary Surgeons. It is an honour which is not to be undertaken lightly, particularly at such a time as this, and I will only say from the bottom of my heart how much I appreciate the compliment which you have paid me. I shall do everything in my power to carry on the great traditions of this chair, and I hope that with your support and help throughout my coming year of office I may carry on the good work that emanates from this body with credit to it and with dignity. I thank you most heartily for my election. (*Applause.*)

My first duty is to pay a tribute of thanks to our retiring President. Everyone in this room knows that he has had a most strenuous year of office. By the occurrence of incidents beyond the control of anybody his year has been made an exceedingly difficult one, involving an enormous sacrifice of time in order to carry out the work here. I am certain that every one of us here has appreciated his efforts and the good work which he has done to the full. Major Mattinson has sacrificed an enormous amount of time to the work of this College, and I should like him to know that we appreciate most deeply his efforts for us during the past year. (*Applause.*)

Major Mattinson: Thank you very much indeed. I thank you, Mr. President, for your very kind words, and all of you for the manner in which you have received them. I particularly thank you for your support of me during a very difficult term of office; I have been well and loyally served by you all, and your help and the aid which I have received from individual members with greater experience than myself, which have always been at my service, have been of the greatest assistance to me. I thank you most sincerely. (*Applause.*)

Election of Other Officers

The President: The next item on the agenda is the election of two Vice-Presidents. The retiring President becomes the senior Vice-President, and we have to elect a second Vice-President.

Professor Buxton: I move that the recommendation of the Selection Committee be accepted, and that Mr. Arnold Spicer be elected second Vice-President for the ensuing year.

Mr. Glover seconded the motion, which was carried unanimously, with acclamation.

Mr. Spicer: I thank you very much indeed for the honour you have done me by electing me second Vice-President. It is an honour which is appreciated all the more because it was so totally unexpected.

The President: We have now to proceed to appoint a Treasurer.

Major Mattinson: I move that Lt.-Colonel P. J. Simpson be re-elected Treasurer—with the customary emoluments of the office! (*Laughter.*)

Captain Mitchell seconded the motion, which was carried unanimously.

Colonel Simpson: Thank you very much indeed for again placing your confidence in me and for placing this office in my (I am afraid) rather incompetent hands. I did have, as you will remember, a little experience of the Treasurership, and then you still further promoted me, which naturally meant my retiring from the Treasurership. I am very pleased to have been able to take it up again, because I did not feel that I was really sacked when I had to leave the office in order to take the chair. I shall try, as some of you may know, to keep a tight hand on finance. (*Applause.*)

The President: We now proceed to the election of the Secretary and Registrar.

Major Mattinson: I move that Mr. Oates be elected Secretary and Registrar of this College. Having had experience of his capacity in these offices, I feel sure that he is fully competent to hold them, and I think that he will be a tower of strength to us when he has had the opportunity of becoming fully conversant with our work.

Professor Buxton: I have very much pleasure in seconding the motion that Mr. Oates be appointed Secretary and Registrar. I have had occasion to work with Mr. Oates during the last few weeks on some rather difficult and intricate problems, and I have found him a great support and help in that work, and in the general way in which he has fallen into and taken up his several duties on behalf of the College. (*Applause.*)

The President: It is with very great pleasure that I put the motion that Mr. Oates be elected Secretary and Registrar.

The motion was carried unanimously.

The Registrar: I should like to thank you most sincerely for the honour you have done me. I have been here only a very short time, and during that time I have been extremely happy. Thank you very much indeed. (*Applause.*)

The President: That completes the business of this meeting.

The proceedings then terminated.

CENTENARY OF ANAESTHESIA

The *British Medical Bulletin* devotes the second number of its fourth (1946) volume to anaesthesia and analgesia, to mark the centenary of anaesthesia. In an introductory editorial it is noted that while there are several dates of importance in the early history of anaesthesia and the centenary of some of these has already been celebrated, the year 1946 marks the conclusion of a hundred years of uninterrupted progress, "and to accept this year as the centenary of anaesthesia is not to ignore the claims of earlier pioneers who, for one reason or another, did not, as Morton did in 1846, effectively initiate the universal adoption of anaesthesia for surgical operations."

The contributors to the issue deal with experimental and clinical subjects, "the common feature of which is relative novelty," while a considerable amount of space has been allotted to historical material. Of particular interest to our readers in the latter connection is the following note (p. 144) contributed by T. H. Bishop:—

Early Use in Veterinary Practice

The Times of January 29th, 1847, reports the successful operation under ether on a horse at the Royal Veterinary College, whilst a novel use is mentioned in the *Athenaeum* for August 14th, 1847:—

"Etherization of Bees.—Several successful experiments have, it is said, been recently made in France on the etherization of bees—so as to be able to take their honey while they are in a state of inaction without necessity of destroying their hives."

On September 4th appeared the following:—

"Acting on the hint recently dropped in this paper from the experiments of a French naturalist, a gentleman of Great Marylebone Street has contrived an apparatus for etherizing bees, which does its work without the least trouble. The bees are at first much agitated; then stupefied, and fall to the ground—when they may be handled with impunity. The effect is produced in little more than a minute and a half."

ABSTRACTS

[Further Contributions to the Knowledge of Spontaneous Tuberculosis in Cattle due to Bacilli of the Human Type (Trans. title). Hillermark, K. (1946.) *Skand. vet. Tidskr.* 545-551. (Translation of abstract in *Schweiz. Arch. Tierheilk.* (1946.) **88**. 219-220.]

At the State Veterinary Institute in Stockholm the author has isolated tubercle bacilli of the human type from more than twelve cattle, all of which reacted to tuberculin prepared from a bovine strain. An account of five of the cases was published in 1942. In seven animals (five cows and two calves) no macroscopic lesions of tuberculosis were found at autopsy but human tubercle bacilli were recovered by animal inoculation or by culture. In five animals the material was taken from the lung and local lymph nodes, in one from the mandibular and portal nodes, and in one from both mesenteric and mediastinal nodes. The source of infection in five of the animals was human beings with "open" tuberculosis who were looking after the animals.

Furthermore, the author has isolated the human type of tubercle bacillus from local caseous and calcified lesions in four calves and one adult bovine, on three occasions from the mesenteric nodes, once from the bronchial nodes, and once from the mediastinal nodes. In all these cases the source of infection was traced to persons attending the animals. The tubercle bacilli were shown by pathogenicity tests and cultural examination to be of the human type.

From these findings the author considers that a systematic typing of tubercle bacilli from local tuberculous lesions in calves in areas where human tuberculosis is common might show a higher incidence of bovine infection with the human tubercle bacillus than hitherto suspected.

E. G. W.

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[Treatment of Experimental Ocular Tuberculosis with Promin. Steenken, W., Jun., Wolinsky, E., & Heise, F. H. (1946.) *Amer. Rev. Tuberc.* **53**. 175-180.]

The value of promin in experimental tuberculosis in guinea-pigs has been well established. The authors describe experiments in which guinea-pigs vaccinated with living attenuated human tubercle bacilli were subsequently infected in the anterior chamber of the right eye with a suspension of fully virulent living human tubercle bacilli. The animals were divided into four groups: some received no treatment, others were given promin orally, a third group received promin orally and locally, and a fourth group consisted of non-vaccinated untreated control animals. Guinea-pigs not previously vaccinated are unsuitable for chemotherapeutic experiments because they are so susceptible to tubercle bacilli that the effects of therapy are not always clear cut. Treatment lasted for 295 days and there was no doubt that the treated animals showed marked retardation of the eye lesions and of the lesions in the internal organs (autopsy findings) as compared with the untreated animals. The method of eye infection seems to offer a relatively rapid and easily observable method for the study of new chemotherapeutic agents for the treatment of tuberculosis.

It is of interest that the non-vaccinated untreated animals all died within 82 days of generalized tuberculosis and showed complete destruction of the infected eye. Vaccinated untreated animals developed a widespread chronic infection and treatment with promin, even if delayed until 109 days after inoculation of virulent culture into the eye, resulted in a significantly less degree of tuberculosis. Oral administration of promin afforded almost as much protection as did a combination of oral dosing and instillation into the infected eye.

E. G. W.

At a meeting of the Council of the Royal College of Surgeons of England, Sir Alfred Webb-Johnson was elected President for the sixth year. Sir Heneage Ogilvie and Sir Cecil Wakeley were elected Vice-Presidents.

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Weekly Wisdom

It has become a race between education and catastrophe.—H. G. Wells.

NOTES AND NEWS

Diary of Events

Aug. 30th.—Meeting of the South Wales Division, N.V.M.A., at Barry Island (Merrie Friars), 2.30 p.m.

Aug. 31st.—Meeting of the Society of Women Veterinary Surgeons at Chester (Queen Hotel), 2.30 p.m.

Sept. 2nd.—Meeting of the Farmers' Club, Royal Empire Society, W.C.1, 2.30 p.m. (Mr. J. R. Warburton: "A Survey of 25 Years' Power Farming").

Sept. 6th.—Meeting of the North Wales Division, N.V.M.A., at Trefriw (Belle Vue Hotel), 2 p.m.

Sept. 24th.—Meeting of the Association of Veterinary Inspectors, Friends' House, Euston Road, London, 2 p.m.

Sept. 22nd-27th inclusive.—Annual Meeting and Conference of the National Veterinary Medical Association of Great Britain and Ireland, to be held in London.

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Annual Congress, N.V.M.A.

With our issue of August 10th a ticket sheet for use in connection with the Congress was distributed to members. They are asked to return this to the General Secretary when completed, not later than September 1st.

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PERSONAL

Marriages.—Green—Scott.—On August 17th, 1946, at All Saints' Church, Gosforth, Reginald Arthur Green, B.Sc., M.R.C.V.S., only son of Mr. and Mrs. Arthur Green, of Finchley, London, to Margaret Rangdale Scott, younger daughter of Mr. and Mrs. Hubert Scott, of Gosforth, Northumberland.

Proctor—Todhunter.—On July 24th, 1946, at Crosthwaite Parish Church, Keswick, Francis John Proctor, B.Sc., M.R.C.V.S., D.V.S.M., elder son of Mr. and Mrs. J. W. Proctor, lately of Langlands, Penrith, and Florence, youngest daughter of Mr. and Mrs. J. Todhunter, 17, Stanger Street, Keswick.

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We are glad to note that one of the new members of the Kennel Club is Mr. S. F. J. Hodgman, M.R.C.V.S., of Shortlands, Kent. He has been appointed to the Committee of the Club and to the Shows Regulation Sub-committee.

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Veterinary Educational Trust

Development of Equine Research

As announced in our last issue, the Veterinary Educational Trust has taken over two properties in the Newmarket district for the establishment of an Equine Research Station, and Professor William C. Miller has been appointed as the first Director of this research institute. It is anticipated that Professor Miller will take up his residence in Newmarket at the end of September and that he will be joined as soon as possible thereafter by Dr. Burkhardt, the equine infertility research Fellow, and Miss Ann Russell, the research Fellow working upon red-worm infestation in horses—the latter after her return from the U.S.A.

Clearly this development, following upon the appointment of Dr. W. R. Wooldridge as Scientific Director for the Trust as a whole, a few months ago, is one likely to be of importance to the profession, and our readers will be interested to learn more of the projected plans.

The generous gesture, also announced in our last issue, of Lady Yule and Miss Gladys Yule, in placing Balaton Lodge at the disposal of the Trust for five years, as a research centre for investigations on problems concerned with thoroughbred horses, will enable the work on sterility and parasitic infestation to be continued and intensified under more spacious conditions.

Balaton Lodge is equipped as a training establishment. It comprises a medium-sized residence, a range of loose boxes built round a grassed courtyard, and another range of boxes built in a straight run. There are isolation units, forage store, garages and the usual subsidiary buildings. The paddock accommodation is limited and requires considerable attention as the result of the occupation by the Army authorities during the past six years. The whole property has now been derequisitioned and it is hoped will shortly be ready for occupation by the Trust.

The property will be used as the central research and laboratory premises for the equine investigations. A certain amount of structural modification may be required, but the principal require-

ments, in order to enable the work to commence, are those associated with the installation of the necessary research equipment. This will be begun in the next few weeks, but it will inevitably be some time before the Station is fully equipped for all the work that is envisaged. The Trust is determined that its Equine Research Station shall ultimately be capable of dealing with every kind of investigation. Only by this means can the advanced training of senior research workers—which is one of the important functions of the Trust—be carried out to the best advantage.

Last week, also, we informed our readers that through the kindness and generosity of Major Durham Matthews, the Trust has very recently acquired the well-known property of Lanwades Park upon extremely generous terms. The mansion is substantially built of Cotswold stone and dark red brick and is situated in an extremely well laid out series of gardens and policies. Many of the ground floor rooms are beautifully panelled in oak and will lend themselves admirably to adaptation as library, museums, etc., with a minimum of alteration. The upper floors will serve as residences for the permanent members of the staff, while research scholars and visitors from overseas, etc., will be able to be accommodated.

An unusual but extremely valuable feature of the house is an upper room fitted as a private cinema, equipped with projector and sound apparatus.

There is a range of stalls and boxes and paddock, and parkland running to over 120 acres. Some of this is now being cropped for the food production effort, but will gradually come under direct control of the Trust.

The Foundation and Development of an Equine Research Station

It has been a frequent comment that during recent years most research activity in Britain has centred around the food-producing animals. The claims of cattle, sheep, pigs and poultry have been pre-eminent because of their economic value to agriculture; those of the horse have been relatively neglected. The internal combustion engine has taken over a big proportion of, though by no means all, the road and farm work of haulage, and interest in the horse has become restricted.

Endeavours have been made to direct attention to urgent problems of horse breeding, especially by such bodies as the Thoroughbred Breeders' Association, and the work done at Cambridge upon reproduction, and in Edinburgh upon grass sickness, have been the only instances of serious equine research work for some years past.

Considering the enormous value of the thoroughbred horse and the pre-eminent position of British bloodstock throughout the world, it has been a matter for great regret and a point of criticism by overseas visitors that no centre existed where the problems of the horse in all their aspects could be studied. Nor is there any national centre where records of performance are collated and made readily available for posterity as well as for current use. It is the intention of the Trust to establish at Balaton Lodge and Lanwades Park exactly this sort of Equine Institute: a centre where the past history of the horse can be preserved, where a comprehensive library of equine archives can be built up and maintained, and where information can be made available.

This, however, though valuable, is in some ways of only secondary importance. The Trust is determined to develop the centre as a well equipped modern equine research institute with both permanent and temporary research workers, and where research guests from other institutes or from overseas countries may be accommodated for long or short periods. It is hoped that it may be possible to build up facilities for research work of every description—concerned with problems of genetics and inheritance, reproduction, feeding and management as well as disease prevention or control. The whole outlook will be concentrated upon the horse and its problems. To give effect to this laudable project, the Veterinary Educational Trust will require the support, encouragement and backing of the horse-owning public and those interested in the welfare and development of the horse. If the support which the Trust has already received from many owners of horses can be taken as an augury for the future, the prospects are bright indeed. The Trust is extremely grateful to those who have already helped in such a material way, and is determined that its work during the next few years shall justify and confirm the faith of those who have already assisted so admirably.

The Future Association with Cambridge.—Criticism is often made that certain research institutes have been established in areas of the country where they are isolated geographically from the big centres of academic thought. The Veterinary Educational Trust appreciate the dangers of this isolation and have fortunately been enabled to establish their Institute in relatively close proximity to Cambridge, where they will have the advantage of ready association with such activities as those at the Institute of Animal Pathology, School of Agriculture, the School of Physiology, National Institute of Agricultural Botany and others. It is anticipated that this will lead to an intimate co-operation, which will be of mutual benefit. It is no secret that major developments are likely to take place during the next few years in and around Cambridge, and future prospects for the undergraduate and research worker interested in livestock problems at this University promise to be encouraging.

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UNIVERSITY OF LONDON EXAMINATIONS IN VETERINARY SCIENCE

Pass List (July, 1946)

First Examination.—Goddard, Arthur (Royal Veterinary College); Hosie, Kenneth Forbes (Veterinary College and Technical College, Glasgow).

The following Higher School candidate has completed exemption from the First Veterinary Science: Whittlestone, John Franklyn.

Second Examination.—Biggers, Jeanne Mary; Chandler, Richard Lionel; Darbyshire, James Humphrey, and Graves, John Andrew (all of the Royal Veterinary College).

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SCHEME FOR THE CONTROL OF DISEASES OF DAIRY CATTLE

Statement showing the Number of Undertakings notified to the Ministry of Agriculture during the Month ended July 31st, 1946

County	Undertakings Notified		Total Undertakings		
	During Month	Previously	Number	Number of Cattle	
				Cows	Heifers
ENGLAND					
Bedford	—	34	34	777	435
Berks	—	85	85	3,124	2,050
Bucks	—	71	71	2,558	1,313
Cambridge	—	10	10	190	79
Chester	—	319	319	10,612	4,164
Cornwall	—	4	4	72	75
Cumberland	—	57	57	1,454	1,226
Derby	3	314	317	9,051	5,164
Devon	1	309	310	4,585	2,667
Dorset	—	64	64	2,049	1,121
Durham	—	243	243	5,241	2,193
Essex	1	206	207	6,934	4,278
Gloucester	—	93	93	2,485	1,776
Hampshire	1	349	350	10,263	7,075
Hereford	—	10	10	280	157
Hertford	—	79	79	2,334	1,547
Hunts	—	7	7	280	165
Isle of Ely	—	1	1	57	21
Isle of Wight	—	4	4	52	139
Kent	—	156	156	3,649	2,213
Lancs	—	157	157	4,509	1,653
Leics.	1	100	101	2,535	1,939
Lincs (Holland)	—	3	3	25	11
Lincs (Kesteven)	—	23	23	321	192
Lincs (Lindsey)	—	102	102	1,975	1,196
Middlesex	—	13	13	419	219
Norfolk	—	132	132	4,267	3,012
Northants	1	72	73	2,145	1,815
Northumberland	1	52	53	1,670	1,172
Notts	—	163	163	3,601	2,238
Oxford	—	42	42	1,184	1,901
Rutland	—	1	1	12	5
Salop	—	222	222	6,446	3,436
Soke of Peterborough	—	—	—	—	—
Somerset	—	259	259	6,783	3,241
Staffs	—	176	176	4,393	3,572
Suffolk, E.	—	56	56	1,233	857
Suffolk, W.	—	48	48	1,010	744
Surrey	1	93	94	2,752	1,337
Sussex, E.	—	103	103	4,100	2,587
Sussex, W.	—	102	102	2,824	1,627
Warwick	2	115	117	2,683	1,906
Westmorland	—	7	7	176	173
Wilts	—	83	83	3,376	1,468
Worcester	1	136	137	2,641	1,344
Yorks, E.R.	—	95	95	1,671	906
Yorks, N.R.	—	100	100	3,211	179
Yorks, W.R.	2	238	240	5,794	2,374
WALES					
Anglesey	—	48	48	829	596
Brecon	—	12	12	204	129
Caernarvon	—	63	63	910	473
Cardigan	1	37	38	692	451
Carmarthen	4	230	234	4,414	2,350
Denbigh	—	29	29	604	294
Flint	—	44	44	1,002	566
Glamorgan	—	91	91	1,457	654
Merioneth	—	10	10	137	65
Monmouth	—	53	53	1,241	688
Montgomery	—	14	14	283	248
Pembroke	—	40	40	845	707
Radnor	—	—	—	—	—
TOTALS	20	5,839	5,859	150,421	86,083

Notes.—(1) Operative period of undertakings: 1 year, 1,566; 2 years, 404; 3 years, 3,889. (2) Undertakings renewed for further periods: 1 year, 2,024; 2 years, 232; 3 years, 794. (3) Undertakings not renewed at ends of operative periods, 2,081. (4) The figures showing the number of undertakings notified during the month, relate to entirely fresh undertakings, and do not include those renewed for further periods. Undertakings which have been cancelled or not renewed are not included in the figures for previous notifications.

County	Undertakings Notified		Total Undertakings		
	During Month	Previously	Number	Number of Cattle	
				Cows	Heifers
Aberdeen	—	18	18	890	411
Angus	—	16	16	626	430
Argyll	—	2	2	33	74
Ayr	—	14	14	447	280
Banff	—	1	1	120	20
Berwick	—	1	1	20	—
Bute	—	—	—	—	—
Caithness	—	—	—	—	—
Clackmannan ..	—	4	4	161	103
Dumfries	—	12	12	612	568
Dunbarton	—	1	1	60	40
East Lothian ..	—	1	1	20	8
Fife	—	26	26	939	534
Inverness	—	2	2	106	46
Kincardine ..	—	3	3	97	63
Kinross	—	3	3	62	43
Kirkcudbright ..	1	8	9	980	755
Lanark	—	7	7	296	225
Midlothian	—	—	—	—	—
Moray	—	—	—	—	—
Nairn	—	—	—	—	—
Orkney	—	—	—	—	—
Peebles	—	—	—	—	—
Perth	—	8	8	285	225
Renfrew	—	4	4	151	101
Ross-shire	—	1	1	58	43
Roxburgh	—	—	—	—	—
Selkirk	—	—	—	—	—
Stirling	—	9	9	293	277
Sutherland	—	4	4	74	29
West Lothian ..	—	—	—	—	—
Wigtown	—	15	15	994	555
Zetland	—	—	—	—	—
TOTALS ..	1	160	161	7,324	4,831

Notes.—(1) Duration of undertakings: 1 year, 47; 2 years, 9; 3 years, 105. (2) Undertakings renewed for a further period (included in column 2 of statement): 1 year, 83; 2 years, 9; 3 years, 65. (3) Undertakings expired and not renewed (not included in column 2 of statement), 229. (4) The figures showing the number of undertakings notified during the month relate to entirely fresh undertakings.

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ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

SWINE FEVER:

Berkshire.—19, Eynsham Road, Botley, Berks. (Aug. 19th).

Lancashire.—Old Hall Farm, Sedgley Park Road, Prestwich, Manchester, Lancs. (Aug. 15th).

Lincs. (*Lindsey*).—1, Council House, Toynton All Saints, Spilsby, Lincs. (Aug. 13th).

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LEGAL NOTES

Stipulations Destroy Value of Warranty.—A case raising an interesting point in auction sale conditions (reports the *Farmer and Stock-Breeder*) was heard at Wincanton County Court, Somerset, when Lt.-Col. R. H. Couchman, Whitestaunton Manor, Chard, claimed £34 12s. from Wm. Parker Hill, farmer, Grove Farm, Castle Cary, alleging breach of warranty in the sale of a heifer.

Plaintiff's case was that the heifer was warranted "unserved" but proved to be in-calf, and died as a result of the misrepresentation two months after purchase. Defendant relied on the conditions of sale at the auction, which it was contended excluded all warranties.

Judge Kirkhouse Jenkins, giving judgment, said plaintiff relied on a description in the sale catalogue, and upon oral representations made by the auctioneer and by the defendant as evidence of the warranty. The sale catalogue stated the sale would be subject to the auctioneer's usual conditions, and that they would not be responsible for any error or mis-statement in the catalogue. In his view the main contract between the vendor and the purchaser contained the vital words, "subject to all faults or errors of description (if any), and no compensation will be paid."

Giving judgment for the defendant, the Judge said the qualifying stipulations destroyed the value of the warranty and provided the vendor with an answer to the claim.

* * * * *

Dogs Improperly Kept.—Charles Henry Edwards, of Bassett Green Road, Southampton, was sentenced to three months' imprisonment and banned from keeping a dog for ten years, for causing suffering to seven dogs by not giving them sufficient care and exercise.

Thomas Evans, R.S.P.C.A. inspector, said he found a large number of dogs chained up in kennels of all sorts of descriptions—such as oil drums, dilapidated boxes, pieces of planking, and old cisterns.

All the dogs were extremely savage, and next time he went he was compelled to defend himself with a truncheon. It was pitted with teeth-marks made by the dogs and he was bitten three times. He destroyed seven of 15 dogs. "Young dogs were running about too numerous to count," he added.

He went there again with Major Hancock, the Society's Veterinary Surgeon, and a police sergeant, and they had to fight their way in, defending themselves with sticks and truncheons.

It was reported that 12 of the dogs had been destroyed, and the Bench ordered the destruction of the remainder.

Edwards, who pleaded not guilty, said he exercised the dogs at night.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal views of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.

Notice to Correspondents

The Editorial Committee regrets that, the paper supply situation having deteriorated, it has become necessary to ask correspondents again to accept a limitation on the length of letters submitted for publication. Accordingly, contributors to our Correspondence Columns are requested to note that, until further intimation is made, their communications must not exceed 350 words.

* * * * *

R.C.V.S. COUNCIL ELECTION

Sir,—I trust that, even at this late date, I may be afforded the courtesy of your columns to express my sincere thanks to those who recorded votes in my favour at the Council Election. As my nomination was made only very shortly before the election, and after the overseas voting papers had been issued, the result was personally most gratifying. It will be my constant concern to seek to justify the confidence thus displayed, with particular reference to the duty of maintaining the dominant pre-eminence of Council in all veterinary educational matters. My delay in submitting this acknowledgment to the electors has been caused by the fact that I was not aware of the precise result until the *Record* reached me.

Yours faithfully,

J. T. EDWARDS.

School of Veterinary Medicine,
Fuad I University, Giza, Cairo.
August 1st, 1946.

[As our readers will have learned from the announcement made in our issue of April 13th, Dr. Edwards is on an official mission to the School of Veterinary Medicine at Fuad University, at the request of the Egyptian Government, in connection with the re-organization of veterinary education in Egypt.—*Editor.*]

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DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV).

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Parasitic Mange*	Sheep Scab	Swine Fever
July 16st to 31st, 1946 ...	3	1	1	1	6
Corresponding period in—					
1945 ...	6	1	1	1	37
1944 ...	5	2	—	—	47
1943 ...	11	—	—	3	28
Total Jan. 1st to July 31st, 1946 ...	60	30	5	39	288
Corresponding period in—					
1945 ...	65	99	6	47	579
1944 ...	118	29	6	61	518
1943 ...	182	10	6	104	309

NOTE.—The figures for the current year are approximate only.
* Excluding outbreaks in Army Horses.

Tuberculosis (Attested Herds) Schemes

The number of Attested Herds, *i.e.*, herds officially certified as free from Tuberculosis as at July 31st, 1946, was as follows:—

ENGLAND	WALES	SCOTLAND	TOTAL (GREAT BRITAIN)
6,203	9,994	6,959	23,156